

Claims:

1. A catalyst capable of supporting combustion beyond the fuel rich limit of flammability comprising a catalytic component and a metallic support wherein the support is a metallic structured packing comprising a multiplicity of open-ended channels and which has been loaded with a non metallic coating.
- 5 2. A catalyst as claimed in claim 1, wherein the catalyst component comprises a Group VIIIB metal.
3. A catalyst as claimed in claim 1 or claim 2, wherein the metallic support is selected from FeCrAlY, NiCrAlY, CoCrAlY, Ni-Chrome, Inconel and Monel.
- 10 4. A catalyst as claimed in any one of the preceding claims, wherein the metallic support is in the form of a foam having a pore size in the range of 10 pores per inch (ppi) to 100ppi.
5. A catalyst as claimed in any one of claims 1 to 4, wherein the metallic support is in the form of a monolith having between 2000cpi (cells per inch) to 5cpi.
- 15 6. A catalyst as claimed in any one of the preceding claims, wherein the metallic support comprises a series of blocks or layers that tessellate together to leave no gaps.
7. A catalyst as claimed in any one of the preceding claims, wherein the non metallic coating is a ceramic material selected from alumina, silica-alumina, a combination of alumina and mullite, lithium aluminium silicate, cordierite, silicon carbide, zirconia toughened alumina, partially stabilized zirconia, fully stabilized zirconia, spinel,
- 20 chromia, titania, aluminium titanate, or any combination of the above.
8. A catalyst as claimed in any one of the preceding claims, wherein the non-metallic has been loaded onto the support by any one of the following methods; aluminizing,

chemical vapour deposition, sputter coating and washcoating.

9. A catalyst as claimed in claim 8, wherein washcoating is used to provide the non-metallic coating on the metallic support.

10. A process for the production of an olefin, said process comprising passing a mixture of a hydrocarbon and an oxygen-containing gas over a catalyst as claimed in any one of claims 1 to 9.

11. A process as claimed in claim 10, wherein hydrogen is co-fed with the hydrocarbon and oxygen-containing gas to the reaction zone.

12. A process as claimed in claim 10 or claim 11, wherein a non catalytic resistance zone is located upstream of the catalyst.

13. A process as claimed in any one of claims 10 to 12, wherein the ratio of hydrocarbon to oxygen-containing gas is 5 to 16, times the stoichiometric ratio of hydrocarbon to oxygen-containing gas required for complete combustion of the hydrocarbon to carbon dioxide and water.

14. A process as claimed in any one of claims 10 to 13, wherein the process is operated at a pressure of between 10-30barg.

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